WHAT IS CLAIMED IS

1   1.   A method comprising:

2   converting logical aspects of a common warehouse model (CWM) to

3   corresponding design items for a relational database by processing in a

4   hierarchical manner the logical aspects and creating the corresponding design

5   items, the logical aspects comprising entity-relationship (ER) libraries, the ER

6   libraries comprising ER models, the corresponding design items comprising

7   design libraries, the design libraries comprising design models.

1   2.   The method of Claim 1 wherein converting comprises the operations of:

2   (a)   scanning through the ER libraries;

3   (b)   for a first of the ER libraries, creating a corresponding first design

4   library;

5   (c)   for each of the ER models in the first ER library, creating a

6   corresponding design model in the corresponding first design library to

7   hold corresponding information;

8   (d)   processing each of the ER models to produce corresponding

9   .   information for the corresponding design model;

10   (e)   determining if there are any references between the ER models;

11   and

12   (f)   if there are any references between the ER models, specifying

13   corresponding references in corresponding design models.

1   3.   The method of Claim 2 wherein, in operation (d), each of the ER models

2   is processed independently.

1   4.   The method of Claim 1 wherein operation (d) comprises:

2   processing ER subject areas included in a first of the ER models;

3   processing ER domains included in the first ER model;

4   processing domain inheritance for each of the ER domains;

5   processing ER entities included in the first ER model;

6   processing entity subtype relationships in the first ER model; and

7   processing non-subtype relationships in the first ER model.

1   5.   The method of Claim 4 wherein processing ER subject areas

2 comprises:

3   for each of the ER subject areas included in the first ER model, creating

4 a corresponding design subject area in the corresponding first design model.

1   6.   The method of Claim 4 wherein processing domains comprises:

2   for each of the ER domains included in the first ER model, creating a

3 corresponding design domain in the corresponding first design model;

4   determining parameters for each of the ER domains, including base

5 type, default and constraint; and

6   setting corresponding parameters for each of the corresponding design

7 domains.

1 7.   The method of Claim 4 wherein processing domain inheritance

2 comprises:

3   determining, for a first of the ER domains, whether there is a first

4 generalization in the CWM that links the first ER domain;

5   if there is the first generalization, determining parent ER domain and

6 child ER domain for the first generalization, the parent and child ER domains

7 corresponding to corresponding parent and child design domains; and

8   creating inheritance link from the corresponding child design domain to

9 the corresponding parent design domain.

1 8.   The method of Claim 4 wherein processing ER entities comprises:

2   for a first ER entity included in the first ER model, creating a

3 corresponding first design entity in the corresponding first design model;

4   determining first ER subject areas associated with the first ER entity, the

5 first ER subject areas corresponding to first design subject areas;

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6   adding the corresponding first design entity as a member of the
7 corresponding first design subject areas; and

8   processing attributes associated with the first ER entity.

1 9.   The method of Claim 8 wherein processing attributes associated with the
2 first ER entity comprises:

3   creating a first design attribute to correspond to the first ER attribute;

4   attaching the design attribute to the first design entity;

5   setting type reference of the first design attribute;

6   determining whether the first ER attribute is part of a first ER primary key
7 associated with the first ER entity; and

8   if the first ER attribute is part of the first ER primary key, flagging the first
9 design attribute as part of a first design primary key associated with the first
10 design entity.

1 10.   The method of Claim 4 wherein processing entity subtype relationships
2 comprises:
3   determining whether there is a first CWM generalization that links two of
4 the ER entities in the first ER model;

5   if there is the first CWM generalization, determining parent and child ER
6 entities for the first CWM generalization, the parent and child ER entities
7 corresponding to corresponding parent and child design entities; and

8   creating inheritance link from the corresponding child design entity to the
9 corresponding parent design entity.

1 11.   The method of Claim 4 wherein processing non-subtype relationships
2 comprises:

3   obtaining references to parent and child ER entities in a first ER
4 relationship, the parent and child ER entities corresponding to parent and child
5 design entities in the first design model;

6   creating a corresponding design link between the corresponding parent
7 and child design entities in the first design model;

8   setting cardinality and relationship type for the corresponding design
9 link;

10   determining whether first ER relationship has at least one referential
11 rule; and

12   if the first ER relationship has at least one referential rule, processing the
13 at least one referential rule.

1 12.   The method of Claim 11 wherein processing the at least one referential
2 rule comprises:

3   obtaining parameters including "insert", "update" and "delete" from the
4 CWM;

5   setting corresponding parameters for the corresponding design link;

6   determining whether there is an ER attribute in the child ER entity that
7 has migrated from the parent ER entity; and

8   if there is such an ER attribute corresponding to a design attribute, then:
9   creating a design foreign key under the child design entity; and
10   creating references to the corresponding design attribute.

1 13.   A method comprising: _j

2 converting logical aspects of a common warehouse model (CWM) to
3 corresponding design items for a relational database by processing in a
4 hierarchical manner the logical aspects and creating the corresponding design
5 items, the logical aspects comprising entity-relationship (ER) libraries, the ER
6 libraries comprising ER models, the corresponding design items comprising
7 design libraries, the design libraries comprising design models; and

8 converting physical aspects of a common warehouse model (CWM) to
9 corresponding database management system (DBMS) items in a relational
10 database by processing in a hierarchical manner the physical aspects and

11 creating the corresponding DBMS items, the physical aspects comprising
12 relational catalogs, the relational catalogs comprising relational schemas, the
13 corresponding DBMS items comprising DBMS catalogs, the DBMS catalogs
14 comprising DBMS schemas.

1 14. The method of Claim 13 wherein converting logical aspects comprises
2 the operations of:

3   (a)   scanning through the ER libraries;

4   (b)   for a first of the ER libraries, creating a corresponding first design
5   library;

6   (c)   for each of the ER models in the first ER library, creating a
7   corresponding design model in the corresponding first design library to
8   hold corresponding information;

9   (d)   processing each of the ER models to produce corresponding
10   information for the corresponding design model;

11   (e)   determining if there are any references between the ER models;
12   and

13   (f)   if there are any references between the ER models, specifying
14   corresponding references in corresponding design models;

15 and wherein converting physical aspects comprises:

16   (g)   scanning through the relational catalogs;

17   (h)   for a first of the relational catalogs, creating a corresponding first
18   DBMS catalog in the relational database;

19   (i)   for each of the relational schemas in the first relational catalog,
20   creating a corresponding DBMS schema in the corresponding DBMS
21   catalog to hold corresponding information; and

22   (j)   processing each of the relational schemas to produce
23   corresponding information for the corresponding DBMS schema.

1 15.   An article of manufacture comprising:

2   a machine-accessible medium including data that, when accessed by a
3   machine, cause the machine to perform the operation of:

4   converting logical aspects of a common warehouse model (CWM) to
5   corresponding design items for a relational database by processing in a
6   hierarchical manner the logical aspects and creating the corresponding design
7   items, the logical aspects comprising entity-relationship (ER) libraries, the ER
8   libraries comprising ER models, the corresponding design items comprising
9   design libraries, the design libraries comprising design models.

1   16.   The article of manufacture of Claim 15 wherein the operation of
2   converting comprises the operations of:

3   (a)   scanning through the ER libraries;

4   (b)   for a first of the ER libraries, creating a corresponding first design
5   library;

6   (c)   for each of the ER models in the first ER library, creating a
7   corresponding design model in the corresponding first design library to
8   hold corresponding information;

9   (d)   processing each of the ER models to produce corresponding
10   information for the corresponding design model;

11   (e)   determining if there are any references between the ER models;
12   and

13   (f)   if there are any references between the ER models, specifying
14   corresponding references in corresponding design models.

1   17.   The article of manufacture of Claim 16 wherein, in operation (d), each of
2   the ER models is processed independently.

1   18.   The article of manufacture of Claim 15 wherein operation (d) comprises
2   the operations of:
3   processing ER subject areas included in a first of the ER models;
4   processing ER domains included in the first ER model;
5   processing domain inheritance for each of the ER domains;

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6   processing ER entities included in the first ER model;

7   processing entity subtype relationships in the first ER model; and

8   processing non-subtype relationships in the first ER model.

1 19. The article of manufacture of Claim 18 wherein the operation of

2 processing ER subject areas comprises:

3   for each of the ER subject areas included in the first ER model, creating

4   a corresponding design subject area in the corresponding first design

5   model.

1 20. The article of manufacture of Claim 18 wherein the operation of

2 processing domains comprises:

3   for each of the ER domains included in the first ER model, creating a

4 corresponding design domain in the corresponding first design model;

5   determining parameters for each of the ER domains, including base

6 type, default and constraint; and

7   setting corresponding parameters for each of the corresponding design

8 domains.

1 21. The article of manufacture of Claim 18 wherein the operation of

2 processing domain inheritance comprises:

3   determining, for a first of the ER domains, whether there is a first

4 generalization in the CWM that links the first ER domain;

5   if there is the first generalization, determining parent ER domain and

6 child ER domain for the first generalization, the parent and child ER domains

7 corresponding to corresponding parent and child design domains; and

8   creating inheritance link from the corresponding child design domain to

9   the corresponding parent design domain.

1 22. The article of manufacture of Claim 18 wherein the operation of

2 processing ER entities comprises:

3 .   for a first ER entity included in the first ER model, creating a

4 corresponding first design entity in the corresponding first design model;

5   determining first ER subject areas associated with the first ER entity, the
6   first ER subject areas corresponding to first design subject areas;

7   adding the corresponding first design entity as a member of the
8   corresponding first design subject areas; and

9   processing attributes associated with the first ER entity.

1   23.   The article of manufacture of Claim 22 wherein the operation of
2   processing attributes associated with the first ER entity comprises:

3   creating a first design attribute to correspond to the first ER attribute;

4   attaching the design attribute to the first design entity;

5   setting type reference of the first design attribute;

6   determining whether the first ER attribute is part of a first ER primary key
7   associated with the first ER entity; and

8   if the first ER attribute is part of the first ER primary key, flagging the first
9   design attribute as part of a first design primary key associated with the first
10   design entity.

1   24.   The article of manufacture of Claim 18 wherein the operation of
2   processing entity subtype relationships comprises:
3   determining whether there is a first CWM generalization that links two of
4   the ER entities in the first ER model;

5   if there is the first CWM generalization, determining parent and child ER
6   entities for the first CWM generalization, the parent and child ER entities
7   corresponding to corresponding parent and child design entities; and

8   creating inheritance link from the corresponding child design entity to the
9   corresponding parent design entity.

1   25.   The article of manufacture of Claim 18 wherein the operation of
2   processing non-subtype relationships comprises:

3   obtaining references to parent and child ER entities in a first ER

4 relationship, the parent and child ER entities corresponding to parent and child

5 design entities in the first design model;

6   creating a corresponding design link between the corresponding parent

7 and child design entities in the first design model;

8   setting cardinality and relationship type for the corresponding design

9 link;

10   determining whether first ER relationship has at least one referential

11 rule; and

12   if the first ER relationship has at least one referential rule, processing the

13   at least one referential rule.

1 26.   The article of manufacture of Claim 25 wherein the operation of

2 processing the at least one referential rule comprises:

3   obtaining parameters including "insert", "update" and "delete" from the

4 CWM;

5   setting corresponding parameters for the corresponding design link;

6   determining whether there is an ER attribute in the child ER entity that

7 has migrated from the parent ER entity; and

8   if there is such an ER attribute corresponding to a design attribute, then:

9   creating a design foreign key under the child design entity; and

10   creating references to the corresponding design attribute.

1 27.   A system comprising:

2 a processor; and

3 a memory coupled to the processor, the memory containing program code that,

4 when executed by the processor, causes the processor to perform the

5 operation of:

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6 converting logical aspects of a common warehouse model (CWM) to
7 corresponding design items for a relational database by processing in a
8 hierarchical manner the logical aspects and creating the corresponding design
9 items, the logical aspects comprising entity-relationship (ER) libraries, the ER
10 libraries comprising ER models, the corresponding design items comprising
11 design libraries, the design libraries comprising design models.

1 28. The system of Claim 27 wherein the operation of converting comprises
2 the operations of:

3   (a)   scanning through the ER libraries;

4   (b)   for a first of the ER libraries, creating a corresponding first design
5   library;

6   (c)   for each of the ER models in the first ER library, creating a
7   corresponding design model in the corresponding first design library to
8   hold corresponding information;

9   (d)   processing each of the ER models to produce corresponding
10   information for the corresponding design model;

11   (e)   determining if there are any references between the ER models;
12   and

13   (f)   if there are any references between the ER models, specifying
14   corresponding references in corresponding design models.

1 29. The system of Claim 28 wherein, in operation (d), each of the ER
2 models is processed independently.

1 30. The system of Claim 27 wherein operation (d) comprises:
2   processing ER subject areas included in a first of the ER models;
3   processing ER domains included in the first ER model;
4   processing domain inheritance for each of the ER domains;
5   processing ER entities included in the first ER model;
6   processing entity subtype relationships in the first ER model; and
7   processing non-subtype relationships in the first ER model.

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1   31.   The system of Claim 30 wherein the operation of processing ER subject
2   areas comprises:

3   for each ER subject area included in the first ER model, creating a
4   corresponding design subject area in the corresponding first design
5   model.

1   32.   The system of Claim 30 wherein the operation of processing domains
2   comprises:
3   for each of the ER domains included in the first ER model, creating a
4   corresponding design domain in the corresponding first design model;
5   determining parameters for each of the ER domains, including base
6   type, default and constraint; and

7   setting corresponding parameters for each of the corresponding design
8   domains.

1   33.   The system of Claim 30 wherein the operation of processing domain
2   inheritance comprises:
3   determining, for a first of the ER domains, whether there is a· first
4   generalization in the CWM that links the first ER domain;

5   if there is the first generalization, determining parent ER domain and
6   child ER domain for the first generalization, the parent and child ER domains
7   corresponding to corresponding parent and child design domains; and

8   creating inheritance link from the corresponding child design domain to
9   the corresponding parent design domain.

1   34.   The system of Claim 30 wherein the operation of processing ER entities
2   comprises:

3   for a first ER entity included in the first ER model, creating a
4   corresponding first design entity in the corresponding first design model;

5   determining first ER subject areas associated with the first ER entity, the
6   first ER subject areas corresponding to first design subject areas;

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7   adding the corresponding first design entity as a member of the
8 corresponding first design subject areas; and

9   processing attributes associated with the first ER entity.

1 35.   The system of Claim 34 wherein the operation of processing attributes
2 associated with the first ER entity comprises:

3   creating a first design attribute to correspond to the first ER attribute;

4   attaching the design attribute to the first design entity;

5   setting type reference of the first design attribute;

6   determining whether the first ER attribute is part of a first ER primary key
7 associated with the first ER entity; and

8   if the first ER attribute is part of the first ER primary key, flagging the first
9 design attribute as part of a first design primary key associated with the first
10 design entity.

1 36.   The system of Claim 30 wherein the operation of processing entity
2 subtype relationships comprises:
3   determining whether there is a first CWM generalization that links two of
4 the ER entities in the first ER model;

5   if there is the first CWM generalization, determining parent and child ER
6 entities for the first CWM generalization, the parent and child ER entities
7 corresponding to corresponding parent and child design entities; and

8   creating inheritance link from the corresponding child design entity to the
9   corresponding parent design entity.

1 37.   The system of Claim 30 wherein the operation of processing non-
2 subtype relationships comprises:

3 obtaining references to parent and child ER entities in a first ER relationship
4 having ends, the parent and child ER entities corresponding to parent and child
5 design entities in the relational database;

6 creating corresponding link between the corresponding parent and child design

7 entities in the relational database;

8 setting cardinality and relationship type for the corresponding link;

9 determining whether the ends of the first ER relationship have at least one

10 referential rule;

11 if the ends of the first ER relationship have at least one referential rule,

12 processing the at least one referential rule.

1 38. The system of Claim 11 wherein the operation of processing the at least

2 one referential rule comprises:

3 obtaining parameters including "insert", "update" and "delete" from the

4 CWM;

5 setting corresponding parameters for the corresponding design link;

6 determining whether there is an ER attribute in the child ER entity that

7 has migrated from the parent ER entity; and

8 if there is such an ER attribute corresponding to a design attribute, then:

9 creating a design foreign key under the child design entity; and

10 creating references to the corresponding design attribute.